

what is now middle Germany and middle Russia, the continental and glacial origin of the boulder clay being beyond doubt. His remarks on the extension and mode of formation of the loess, which appears with its characteristic features in the ravined parts of the province along the valleys of the larger rivers, are also worthy of notice. It has a continental origin, but rather aqueous than atmospheric.

A FISHERIES EXHIBITION will be held in Lysekil in Sweden early next month.

LAST week at Coblenz experiments were made with young ravens with a view of replacing carrier-pigeons by them. The ravens are not so subject to being attacked and destroyed by birds of prey. The ravens were sent from Coblenz to a small place on the Moselle near Treves, a distance of about forty miles. The experiments proved eminently successful.

THE additions to the Zoological Society's Gardens during the past week include two Silver-backed Foxes (*Canis chama* ♂ & ♀) from South Africa, presented by Mr. John Maydon; a Syrian Bear (*Ursus syriacus*) from Thibet, presented by Mr. A. W. Hicks Beach; two Red-backed Shrikes (*Lanius collurio*), British, presented by Mr. D. Bowl; a Sparrow Hawk (*Accipiter nisus*), British, presented by Mr. F. Gunn; two Spotted Salamanders (*Salamandra maculosa*), European, presented by Miss Harris; two Russ's Weaver Birds (*Quelea russi*) from West Africa, three Java Sparrows (*Padida oryzivora*) from Java, two Saffron Finches (*Sycalis flaveola*) from Brazil, two Undulated Grass Parakeets (*Melopsittacus undulatus*) from Australia, a Gray-headed Love Bird (*Agapornis cana*) from Madagascar, a Goldfinch (*Carduelis elegans*), two Bullfinches (*Pyrrhula europæa*), a Chaffinch (*Pringilla caelebs*), a Lesser Redpole (*Linota rufescens*), a Siskin (*Chrysomitris spinus*), British, an Indian Python (*Python molurus*) from India, deposited; five Blue-headed Pigeons (*Starnenas cyanocephalus*) from Cuba, purchased; a Quebec Marmot (*Arctomys monax*), two Gray Squirrels (*Sciurus cinereus*) from North America, a Plantain Squirrel (*Sciurus plantani*) from Java, received in exchange; five Common Vipers (*Vipera berus*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

VARIABLE STARS.—The following are Greenwich mean times of geocentric minima of *Algol* to the end of the present year, which fall between about 6h. and 15h.; advantage has been taken of the recent observations of Dr. Julius Schmidt, at Athens, in their calculation:—

| | h. | m. | | h. | m. |
|-------------------|----|------|------------------|----|------|
| 1883, Sept. 3 ... | 12 | 56.5 | 1883, Nov. 5 ... | 14 | 46.9 |
| 6 ... | 9 | 45.0 | 8 ... | 11 | 35.8 |
| 9 ... | 6 | 33.6 | 11 ... | 8 | 24.6 |
| 23 ... | 14 | 36.5 | 28 ... | 13 | 18.2 |
| 26 ... | 11 | 25.1 | Dec. 1 ... | 10 | 7.2 |
| 29 ... | 8 | 13.6 | 4 ... | 6 | 56.2 |
| Oct. 16 ... | 13 | 5.6 | 18 ... | 15 | 1.5 |
| 19 ... | 9 | 54.3 | 21 ... | 11 | 50.6 |
| 22 ... | 6 | 43.0 | 24 ... | 8 | 39.7 |
| | | | 27 ... | 5 | 28.9 |

A geocentric minimum of U Cephei, Ceraski's short-period variable, falls about Dec. 1, 17h. 27m., and this phase takes place earlier in the night, through the winter. On February 19 the calculated time is 11h. 58m. We assume two periods of this star to occupy 4.98559d.

Mr. Chandler having found that the period of Sawyer's variable in Ophiuchus is only 20h. 7m. 41.6^s, this object goes through its fluctuations in a shorter time than any other known variable, R Muscæ following next, according to Dr. Gould, with a period of about 21h. 20m. The variation of light of the former star is stated to be about three-fourths of a magnitude. It is Lalande 31384, Weisse XVII. 143, and Santini + 2°, 200. Argelander and Heis call it 6m. The mean place for 1883.0 is in R.A. 17h. 10m. 35.7^s, Decl. + 1° 20' 32".

The observations of Dr. Schmidt and Mr. Sawyer show that a maximum of χ Cygni occurred on September 2.5, 1882, and

the mean period during the last six or seven years having been about 408 days, another maximum may be expected about October 16. The best position of this variable will be that given by a mean of Argelander's places in vol. vi. of the Bonn observations, viz. for

1855.0 ... R.A. 19h. 44m. 59.66s. ... Decl. + 32° 32' 59".4

With Peters' constants we find—

Precession in R.A. 2.3065s. Secular variation + 0.0013s.
 „ Decl. + 8".870. „ „ + 0".298

Whence for the beginning of the year 1884 the position becomes R.A. 19h. 46m. 6.5s. Decl. + 32° 37' 15".

The confusion that has taken place as to the identification of the true variable χ Cygni is almost ludicrous. Flamsteed attached Bayer's letter to his 17 Cygni, being misled, as Argelander has shown, by the variable star being faint when he observed. In 1816 Olbers referred, in Lindenau's *Zeitschrift für Astronomie*, ii. 185, to the misunderstandings and complications that had taken place through Flamsteed's mistake, pointing out that Pigott first gave the correct position of Bayer's χ ; it was soon after determined by Koch, and was observed by Lalande in his zone of August 13, 1793. Further, in 1818, Bessel in the *Fundamenta Astronomie*, in a note to 17 Cygni, wrote, "*Flamsteedius hanc stellam per χ designat; sed stella a Bayero ita dicta alia est neque reperitur in catalogo.*" Notwithstanding these rectifications, Baily, in the British Association Catalogue, falls into Flamsteed's error, calling No. 6784, 17 χ Cygni, and to this circumstance is perhaps to be attributed the confusion in recent popular English treatises as to the identification of Kirch's variable. 17 Cygni is a double star (Σ 2580), without any claim to the letter χ ; Bayer's χ is Kirch's variable, and totally distinct from Flamsteed's 17.

A minimum of R Leporis may be expected about December 14; Mr. Sawyer found the star at a maximum about January 25, 1882.

THE GREAT RED SPOT UPON JUPITER'S DISK.—Prof. A. Riccio, of the Observatory at Palermo, in a communication to the *Memorie della Società degli Spettroscopisti Italiani*, gives interesting details of his observations on the features of Jupiter's disk, during the last opposition. The red spot had become very faint, indeed barely distinguishable in April and May, and was invisible at the commencement of June. Mr. Marth, in his "Ephemeris for Physical Observations of Jupiter" for the approaching opposition, has retained the same daily rate of rotation adopted in the ephemerides for the last two oppositions, remarking that even if it should be found that the great reddish spot has entirely faded away, it is still desirable that its place should be specially watched, and hence it has not been advisable to make any alteration in the data for the ephemeris at present.

THE MINOR PLANET, No. 234.—Prof. Peters notifies his discovery of a new minor planet on August 12, and strange to say he estimates it as bright as the ninth magnitude. Its place at 18h. 51m. Greenwich M.T. was in R.A. 21h. 20m. 50s., Decl. - 12° 29'.

No. 175 *Andromache*, to which reference was lately made in this column, has so far escaped observation, though carefully sought for at Rome.

GEOGRAPHICAL NOTES

PROF. ALPHONSE MILNE-EDWARDS, chief of the French deep-sea expedition in the *Talisman*, writes from St. Vincent, Cape Verde Islands, under date July 28, that the expedition had met with complete success. After having investigated the deep-sea fauna of the African coast to a distance of some leagues from Dakar, the expedition proceeded to Santiago and St. Vincent, sounding all the way. The island of Branco, where no naturalist had ever been, was investigated, the great lizards of the island receiving special attention in their native habitat. The coast is so rocky the naturalists had to swim ashore. The island is extremely volcanic, with scarcely any vegetation, although the lizards are herbivorous. The *Talisman* was about to proceed on the last section of her voyage, the investigation of the Sargasso Sea.

THE Austrian corvette *Pola* arrived at Hamburg on the 19th from Jan Mayen. The Austrians, who were entertained at a banquet by the Geographical Society of Hamburg, have brought home a large quantity of natural history specimens and photographs, and express themselves highly pleased with the results of their expedition.

THE northernmost of the international meteorological stations round the Pole is that of the United States, in command of Lieut. Greely. It is situated in $81\frac{1}{2}^{\circ}$ N. lat., close to where Nares wintered, on the coast of Smith's Sound in Lady Franklin Bay. Since 1881, when the expedition took up its quarters, no news of any kind has arrived, as the vessel despatched in order to communicate with the same last summer could not get up for ice. This summer a strong attempt to relieve the party will be made, for which purpose the steamer *Proteus* has just left Franklin Bay accompanied by the U.S. war vessel *Yantic*. Should, however, the condition of the ice also this summer be unfavourable, the relief expedition will be put ashore at a certain point on the east coast of Smith's Sound, and the *Proteus* will return. By the aid of Eskimo the expedition will attempt during the winter to relieve Lieut. Greely and his comrades, who have instructions to depart from their station if not relieved in the autumn. Depots with 1200 rations at each will be established along the route, and as Greely is provisioned up to the summer of 1884, there is no fear of his safety. During next summer a vessel will be despatched from the United States to bring home both expeditions, which will by then, no doubt, be found safe in some spot on the east coast of Smith's Sound.

HEFT VIII. of *Petermann's geographische Mittheilungen* contains a long and interesting report by Dr. W. Junker, dated May 1881, from the country of the A-Madi, in the region of the Upper Nile. In consequence of insuperable difficulties connected with the transport of his luggage, Dr. Junker was unable to reach Bakangai, the destination he had proposed for himself, and had to return northwards after crossing to the south bank of the Welle-Makua, in the country of the A-Barambos, to the south of the district of Bahr-el-Ghasal. The greatest difficulties travellers have to contend with is the carriage of their luggage, the natives to the south of that country, including the subjects of Ndoruma, the people of the largest part of the Niamniam region, and all further south being almost quite unavailable for that service. Expeditions sent south from Bahr-el-Ghasal in quest of ivory have, therefore, to take their own porters with them. The travellers Schweinfurth and Miani have generally been under the necessity of attaching themselves to such expeditions, as has also Dr. Junker in all his more extensive travels, though the disadvantages and in particular the delays connected with this mode of travelling are very great. From Palembang, where during ten days he had to live exclusively on sweet batates, Dr. Junker, crossing the watershed which divides the tributaries of the Werre in the north, from those of the Welle-Makua in the south, came, after two days' march, into the land of the A-Madi, a mountainous district, watered by a number of streams diffusing a constant moisture over the gentle declivities of their banks, and nourishing vigorous growths of bananas and oil-palms. Dr. Junker stayed with the Prince Masinde for several days, during which he made an excursion to a group of mountains immediately to the south-south-east, ascending the highest peak, Mount Malingde, whence he had a view of three almost equidistant but topographically very diverse points of the Welle in its sweep from the west to the direct north. The A-Madi are described as a race largely resembling the neighbouring tribes in manners and customs, but whose speech shows not the least affinity to any one of the many languages of the wide surrounding region known to Dr. Junker. In structure they resemble the muscular and shorter figure of the A-Sandeh. They are brachycephalous, of medium stature, far below that of the tall Dinka, Nuêhr, or even the Bongo. The A-Madi tattoo their breasts according to the most diverse patterns, though the face is generally left intact, with the exception of nose and ears. In the working of iron they are far behind the Mangbattu. The fruit of the banana is used at all its different stages as the principal and sometimes the exclusive food of the people. Letters of Dr. Junker to Dr. Emin Bey, extending in date from Jangasi, in the former Munsu's district, now Niangara's, July 17, 1882, to a provisional station in the land of Semio, November 8, 1882, give us the latest details regarding his stay in Mangbattu, and his plans for the future.

BARON MÜLLER, during his travels in the winter of 1881-82 through Eastern Soudan, was shown some new maps executed by the Egyptian staff, under the direction of Reschid Pasha, and gives an account of them in the present number of the *Mittheilungen*. Reschid Pasha was induced to undertake this work in consequence of the want of maps, available for military purposes, of the country on the borders of

Egypt and Abyssinia. The survey of the triangular district defined by the three points, Massowah, Cassala, and Gallabat, was, according to Herr Müller's information, entered upon simultaneously by various surveying parties in 1875. No scientifically accurate set of maps, to be achieved with all the aid of theodolites, astronomical determination of places, and hypso-barometrical measurements, was aimed at, but only such a general plan as would satisfy military requirements. All the maps executed in this way, on the scale generally of 1:1,000,000, did not reach Herr Müller's hands, but only those representing (1) Annesley Bay, (2) Gebel Gadam, (3) the caravan road from Massowah *via* M'Kullu and Ain, (4) the descent of the land at Samharr from Debra-Bizen as far as Ain, including Sabba Guma, Ailet, the Motad Valley, Assus, and Gumhot, (5) Mensa, extending as far as the Northern Hamsen, Dembesan, and Karmeschin. The map of this country is altogether excellent. Particularly well given is the Bogos country, including the Rora Az-Geret with Zad-Amba, Atirba, and the Boggu Valley, as also Halhal and the district of the Red Marea. These maps, due to the admirable energy of Reschid Pasha, though at present studiously concealed from Europeans, and Englishmen especially, must, in Herr Müller's opinion, before long enable people generally to obtain a distinct idea of that most interesting group of plateaus to the north of Abyssinia.—Among other papers in the same number, Dr. H. Polakowsky gives, as a contribution to the geography and ethnography of Central America, a report of an expedition undertaken by the Bishop of Costa Rica (B. A. Thiel, a German by birth), in company with Lieut. L. Fernandez and D. José Ma. Figueroa, to the wild Indian tribes, the Chiripio Indians, of that Republic.—In a letter to Dr. Emin Bey, Lupton Bey, the Governor of Bahr-el-Ghasal, reports an important discovery made by him in the last months of 1882 in the course of travels in the district of the Kredj tribes—the discovery, namely, of a large river of the name of Parpi. Rising in the mountains to the south-west of Hofra-el-Nahass, it runs south through very fertile lands and receives many tributaries, among others the Wille (marked on Schweinfurth's map to the west of Dem Bekir).—The *Mittheilungen* further report a botanical collection made by G. Ruhnher of the Berlin Museum, at Bengasi, a collection which, added to that of Schweinfurth, will materially increase our knowledge of the vegetation of Barka.

It is announced that Dr. Emil Riebeck, who is well known in the geographical world for his successful travels and magnificent collections, is at present engaged in making the arrangements for an undertaking which promises to be of the greatest importance in the history of the exploration of Africa. The expedition is to be carried into execution by Herr Gottlob Adolf Krause, who is at present in Milan, and the immediate object is described as the investigation of the languages and social state of the inhabitants of the region about the Niger, Benue, and Lake Tsad. Herr Krause intends to follow the Niger from its mouth upwards for a distance of about 300 miles, and then probably to take up his position in some suitable spot, whence he can make a general survey of the surrounding country, decide on his further course of action, and await a favourable opportunity for an advance into the interior. He intends to make his first stop either at Ripo Hill, by Egga, an English mission station, or to choose Shonga, near Kabbia.

ACCORDING to intelligence received at Copenhagen, August 18, from St. Petersburg, the Imperial Russian Geographical Society has informed the Danish Minister to Russia that a report is current among the Samoyede inhabitants of the Island of Waigatz that a foreign vessel has wintered on the eastern coast of that island. It was, however, at the same time pointed out that there was nothing to show that the ship in question was the missing Danish vessel *Dijmphna*, which started last year on a voyage of discovery to the North Pole.

THE *Vega*, the famous exploring vessel, returned at the end of last month to Norway from seal-hunting in the Arctic seas with 8750 seals on board.

M. LÉON POIRIER has left to the Geographical Society of Paris one-third of his fortune, the interest on which is to be devoted once every three years to granting an annuity to the Frenchman who shall have most distinguished himself by his travels in the interests of science and commerce.